

Blending process of recycled EPDM and EVA at various ratio

ABSTRACT

A blending process of polymers had been conducted using recycled synthetic rubber, EPDM, and copolymer, EVA. EPDM stands for Ethylene Propylene Diene Monomer rubber while EVA stands for Ethylene Vinyl Acetate. The blending process between these two polymers are quite challenging due to cross-linked recycled EPDM and the blending process is between thermosetting and thermoplastic plastics, where the thermosetting plastic is eventually, cannot be molded and remolded. The main objective of this experiment is to synthesize a composite using blending process and to investigate the mechanical properties of the composite. The mixture of EPDM and EVA was 0:100, 10:90, 20:80, 30:70, 40:60 and 50:50 wt%. The resultant products were then collected and molded with a hot and cold press machine into desired shapes for mechanical testing namely tensile test and hardness test. During the blending process, the incompatibility of both thermosetting plastic and thermoplastic needed to be solved. Three compatibilization techniques had been performed and the optimum conditions for the blending process obtained are 160C for the operating temperature, 50 rpm for the speed capacity, total 200.0 g of specimens, 400 Nm for the torque mean, and time duration for the blending process of 30 minutes. The best ratio composition of blending was determined by assessing tensile and hardness testing properties. As a conclusion, 20:80 wt% of recycled EPDM and EVA was found to be the best blending composition based on the best tensile and hardness testing properties compared to other compositions. However, further work can be improved such as to minimize the particle size of EPDM, in order to enhance the rate of the EPDM being heated and being homogeneously blended.

Keyword: Blending; EPDM; EVA; Mechanical properties